HUAWEI®

6. Security Configuration

7. VPN Configuration

8. Reliability Configuration

9. QoS Configuration

10. DDR Configuration

11. VoIP Configuration

VRP

User Manual – Configuration Guide

Volume 3

V200R001

VRP

User Manual – Configuration Guide

Volume	3
Manual Version	T2-080168-20011213-C-1.5
Product Version	V200R001
BOM	31010868

Huawei Technologies Co., Ltd.

Address:	Huawei Customer Service Building, Kefa Road, Science-based Industrial Park, Shenzhen, P. R. China
Zip code:	518057
Tel:	+86-755-6540036
Fax:	+86-755-6540035
Website:	http://www.huawei.com
E-mail:	support@huawei.com

About This Manual

Contents

To help readers to better understand, use and maintain Quidway series routers, we publish the manual suit of Quidway series routers. This manual suit includes:

- VRP User Manual — Configuration Guide (V1.5) -Volume 1
- *VRP User Manual — Configuration Guide* (V1.5) -Volume 2
- *VRP User Manual — Configuration Guide* (V1.5) -Volume 3
- *VRP User Manual — Command Reference* (V1.5) -Volume 1
- *VRP User Manual — Command Reference* (V1.5) -Volume 2
- *VRP User Manual — Command Reference* (V1.5) -Volume 3
- *Quidway R1602 Router Installation Manual*
- *Quidway R1603/1604 Routers Installation Manual*
- *Quidway R2501 Router Installation Manual*
- *Quidway R2501E Router Installation Manual*
- *Quidway R2509/2511 Routers Installation Manual*
- *Quidway R2509E/2511E Routers Installation Manual*
- *Quidway R4001 Router Installation Manual*
- *Quidway R4001E Router Installation Manual*
- *Quidway R26/36 Modular Router Installation Manual*

Among the manual suit, the first two manuals are applicable to all routers, and the other installation manuals are separately used for their own types of routers.

In *VRP User Manual — Configuration Guide* (V1.5) -Volume 3, the modules are arranged as follows:

- Module 6 Security Configuration (06SC)

This module mainly introduces the principle and basic specific configuration of security features provided by VRP1.5, including AAA configuration, Radius protocol configuration, terminal access security configuration, firewall and packet filtering configuration, IPSec protocol configuration and IKE protocol configuration.

- Module 7 VPN Configuration (07VPN)

This module mainly introduces the principle and specific configuration of VPN solutions provided by VRP1.5, including configuration of L2TP protocol and GRE protocol.

- Module 8 Reliability Configuration (08LC)

This module mainly introduces the principle and specific configuration of backup center and HSRP protocol.

- Module 9 QoS Configuration (09QC)

This module mainly introduces the principle and specific configuration of QoS service features supported by VRP1.5, including configuration of congestion management, priority-queue and custom-queue.

● Module 10 DDR Configuration (10DC)

This module mainly introduces the principle and specific configuration of dial solutions provided by VRP1.5, including Legacy DDR configuration, Dialer Profile configuration and modem management configuration.

● Module 11 VoIP Configuration (11VC)

This module mainly introduces the principle and specific configuration of IP voice service features supported by VRP1.5, including configuration of VoIP, IP Fax, E1 voice, GK client and IPHC.

📖 Note:

For questions regarding the product specifications, please confirm with the concerned personnel in Huawei's Enterprise Network Section as the software specifications are varied with the product of different type.

Target Readers

The manual is intended for the following readers:

● Network engineers
● Technical assistance engineers
● Network administrators

Conventions Used in the Document

Keyboard operation

Format	Description
<Key >	Press the key with key name expressed with a pointed bracket, e.g. **<Enter>**, **<Tab>**, **<Backspace>**, or **<A >.**
<Key 1 + Key 2>	Press the keys concurrently; e.g. **<Ctrl+Alt+A>** means the three keys should be pressed concurrently.
<Key 1, Key 2>	Press the keys in turn, e.g. **<Alt, A>** means the two keys should be pressed in turn.
[Menu Option]	The item with a square bracket indicates the menu option, e.g. **[System]** option on the main menu. The item with a pointed bracket indicates the functional button option, e.g. **<OK>** button on some interface.
[Menu 1/Menu 2/Menu 3]	Multi-level menu options, e.g. **[System/Option/Color setup]** on the main menu indicates **[Color Setup]** on the menu option of **[Option]**, which is on the menu option of **[System]**.

Mouse operation

Action	Description
Click	Press the left button or right button quickly (left button by default).
Double Click	Press the left button twice continuously and quickly.
Drag	Press and hold the left button and drag it to a certain position.

Symbol

Some distinct symbols are employed in the manual to indicate the special notice that should be taken for the operation. The symbols are:

⚠ **Caution, Notice, Warning, Danger:** Notify the special attention that should be given to the operation.

📖 **Note, Prompt, Tip, Thought:** Give further necessary supplement or explanation for the operation description.

HUAWEI®

VRP

User Manual – Configuration Guide

Volume 3

11 – VoIP Configuration (VC)

Chapter 2 IP Fax Configuration

2.1 Overview to IP Fax

Traditional faxes are sent and received over PSTN. Today fax services are widely used due to its advantages, such as many kinds of transmissive information, fast speed for information transmission and easy to use. Type G3 facsimile machines are frequently used fax terminals in the current fax communications. Type G3 fax is a communication equipment with digital signal process technology. In the process, image signal is turned into analog signal through a modem after it is digitized and compressed, then the analog signal is input into switch via general subscriber line.

The so-called IP Fax, just as its name implies, indicates that fax is sent and received over Internet. Quidway series router can provide VoIP function. With the features of IP Fax, it also can offer IP Fax functions. IP Fax can provide PSTN subscribers with Internet fax services, thus the subscribers only need to pay for considerable cheap expenses when sending international and domestic faxes.

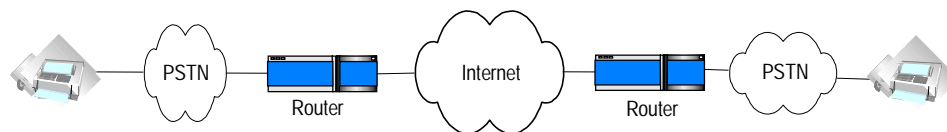The diagram of IP Fax architecture is as follows:

Figure VC-2-1 Architecture of IP Fax

IP realtime fax complies with ITU-T T.30 and T.4 protocols on the side of PSTN and complies with H.323 and T.38 protocols on the side of IP. T.30 protocol is the transmission protocol and recommendation for the document fax in the Public Switched Telephone Network (PSTN). It has made detailed description and rules on the communication process, the signal format adopted in communication, control signaling and error correction mode of category 3 facsimile over PSTN network. T.4 protocol regulates the related standards and specifications for the file transmission through category 3 facsimile terminals. It has made the standardization rules on image coding mode, signal modulation mode and rate, transmission time, error correction mode as well as file transfer mode of the category 3 facsimile terminal. T.38 protocol stipulates the recommendations and specifications for the realtime communication through category 3 facsimile terminals over IP network. It has made some description and rules on the communication mode, packet format, error correction and some communication process of the category 3 facsimile over IP network.

2.2 Configuring IP Fax

2.2.1 Task List of IP Fax Configuration

You should configure VoIP before configuring IP Fax. For the detailed procedure of VoIP configuration, please refer to the section "Chapter 1 VoIP Configuration" in the manual.

IP telephone works after VoIP is configured. Generally speaking, faxes can now be sent and received by using the default configuration of IP Fax only after a facsimile machine is connected. The procedures of configuring IP Fax are mainly used to set up the specific parameters of IP Fax or used for some specified conditions. For example, fax operation can not be completed when the default gateway carrier transmit energy level.

The task of IP Fax configuration is as follows:

- Check if configuring fax to use ECM mode
- Configure fax rate
- Configure fax train mode
- Configure Fax Local-train Threshold Value
- Configure gateway carrier transmit energy level
- Configure redundancy packet number of T38 fax protocol
- Configure the fax protocol intercommunicating with Cisco equipment
- Configure the intercommunication method with other equipment

All of the above configuration tasks should be carried out under the condition of dial peer entity configuration mode.

2.2.2 Checking If Configuring Fax to Use ECM Mode

According to ITU-T Recommendation, Error Correction Mode (ECM) is necessary to the transmission of facsimile message with the half-duplex and half-modulation system of ITU-T V.34 protocol, at the same time the category G3# facsimile terminal operating in full duplex mode is required to support half-duplex mode, that is to support ECM mode.

If the facsimile adopts ECM mode, it has error correction function, and provides automatic request for retransmission (ARQ) technology, at the same time facsimile packet will be transmitted in the form of HDLC frame. On the contrary, if the facsimile machine adopts non-ECM mode (the mode that facsimile must support), it has no error correction function, and the facsimile uses binary string to transmit.

In actual configuration, if the facsimile machines on both sides support ECM mode, but the configuration on the side of gateway is non-ECM mode, then non-ECM mode should be adopted. If the facsimile machine on either or neither of sides does not support ECM mode, then non-ECM mode should also be used. Only when the facsimile machines on both sides support ECM mode and the gateway uses ECM mode, ECM mode can be adopted.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-1 Check if configuring fax to use ECM mode

Operation	Command
Configuring fax does not use ECM mode	**fax-relay ecm disable**
Configuring fax uses ECM mode	**no fax-relay ecm disable**

The gateway does not use ECM mode by default.

2.2.3 Configuring Fax Rate

Subscribers can configure fax rate according to the different protocols.

If it is set to be the values except for "disable" and "voice", the fax rate shall be set to be the corresponding values. The rate set here is not specified rate but the highest allowable rate.

When the setting is voice mode (i.e. "**voice**"), the highest allowable rate of fax should be finally determined by the differences among voice codec protocols.

● The fax rate is 14400bps if G.711 voice encoding & decoding protocol is used
● The fax rate is 4800bps if G.723.1 Annex A voice encoding & decoding protocol is used.
● The fax rate is 7200bps if G.729 voice encoding & decoding protocol is used

The fax function is disable when the setting is "disable".

Please perform the following configuration in dial peer configuration mode.

Table VC-2-2 Configure fax rate

Operation	Command
Configure fax rate	**fax rate { 12000	14400	2400	4800	7200	9600	disable	voice }**

By default, the fax rate will be determined by voice mode.

2.2.4 Configuring Fax Train Mode

Local-train mode indicates that the gateway takes part in the rate train between the facsimile machines on the both ends. In the mode, the facsimile machine and gateway respectively take part in the training, then the receiving gateway sends the train results of the receiving end to the sending gateway, finally the sending gateway will determine the final message transmission rate according to the train results of the receiving end and its own end.

Point-to-point train mode indicates that the gateways do not take part in the rate train between the facsimile machines on the both ends. In the mode, the rate train processes between the two facsimile machine terminals and is transparent to the gateways.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-3 Configure fax train mode

Operation	Command
Configure fax train mode	**fax train-mode { local	ppp}**

The mode is local-train mode (**local**) by default.

2.2.5 Configuring Fax Local-train Threshold Value

When the rate train is being processed between facsimile machines, the sending facsimile machine sends TCF data of "0" to the receiving facsimile machine for 1.5 +10% seconds, then the receiving end will determine if the rate is acceptable according to the received TCF data.

When it is configured to be local-train mode, use this command to configure the threshold value of the local-train. When "1" appears in the received TCF data, it indicates TCF data encountered errors during the transmission. If the number of the

received "1" is less than the preset threshold value, then the current rate train is successful, otherwise, it is not successful.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-4 Configure fax local-train threshold value

Operation	Command
Configure fax local-train threshold value	**fax local-train threshold** *threshold*
Restore the default value of fax local-train threshold value	**no fax local-train threshold**

By default, the fax local-train threshold value is 10. The threshold value ranges from 0 to 100.

2.2.6 Configuring Gateway Carrier Transmit Energy Level

Generally, the default values of gateway carrier transmit energy level are acceptable. If subscriber found fax could not established when the other configurations are correct, you may try to adjust the gateway carrier transmit energy level. Less energy level value shows higher energy.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-5 Configure gateway carrier transmit energy level

Operation	Command
Configure gateway carrier transmit energy level	**fax level** *level*
Restore the default value of gateway carrier transmit energy level	**no fax level**

By default, the gateway carrier transmit energy level is 15. The level value ranges from 3 to 60.

2.2.7 Configuring Sending Redundancy Packet Number of T38 Fax Protocol

Low-speed data indicates the command data compliant with V.21 and the data rate is 300bps. High-speed data indicates TCF and image data.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-6 Configure sending redundancy packet number of T38 fax protocol

Operation	Command
Configure redundancy packet number of low-speed data of T38 fax protocol	**fax protocol t38 ls-redundancy** *number*
Restore the default value of redundancy packet number of low-speed data of T38 fax protocol	**no fax protocol t38 ls-redundancy**
Configure redundancy packet number of high-speed data of T38 fax protocol	**fax protocol t38 hs-redundancy** *number*
Restore the default value of redundancy packet number of high-speed data of T38 fax protocol	**no fax protocol t38 hs-redundancy**

By default, the number for sending two kinds of redundancy packet is 0.The redundancy packet number for sending low-speed data ranges from 0 to 5, and the redundancy packet number for sending high-speed data ranges from 0 to 2.

2.2.8 Configuring the Fax Protocol Intercommunicating with Cisco Equipment

The two kinds of fax protocols including T.38 and Cisco fax protocol are supported. When it intercommunicates with Cisco fax terminal, please select Cisco fax protocol. When it is intercommunicates with other fax terminals supporting T.38 protocol, select T.38 protocol. Because Cisco device does not support the fax local train mode, point-to-point train mode must be adopted to communication with Cisco device.

Please perform the following configuration in dial peer configuration mode.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-7 Configure the fax protocol intercommunicating with Cisco equipment

Operation	Command
Configure the fax protocol intercommunicating with Cisco equipment	**fax protocol { cisco	t38 }**

By default, T.38 protocol is used.

2.2.9 Configuring the Intercommunication Method with Other Equipment

Generally, RTP mode (the corresponding parameter is **rtp**) is used when using T.38 protocol. But you should select to use VT mode (the corresponding parameter is **vt**) if it intercommunicates with the gateway of VocalTec.

Please perform the following configuration in dial peer configuration mode.

Table VC-2-8 Configure the modes intercommunicating with other equipment

Operation	Command
Configure the intercommunication method with other equipment	**fax support-mode { standard	rtp	vt }**

By default, **rtp** protocol is used.

2.3 Monitoring and Maintenance of IP Fax

Please use the following commands to monitor and maintain IP Fax in the privileged user mode.

Table VC-2-9 Monitoring and maintenance of IP Fax

Operation	Command
Open all of the debugging information switches of ipfax	**debug ipfax all**
Open the debugging information switch of function api of ipfax	**debug ipfax api**
Open the debugging information switch of main task of ipfax	**debug ipfax cc**
Open the debugging information switch of controller of ipfax	**debug ipfax controller**
Open the debugging information switch of level 1 error message of ipfax	**debug ipfax error 1_level**
Open the debugging information switch of level 2 error message of ipfax	**debug ipfax error 2_level**
Open the debugging information switch of level 3 error message of ipfax	**debug ipfax error 3_level**
Open the debugging information switch of all levels of error messages of ipfax	**debug ipfax error all**
Open the debugging information switch of T38 message of ipfax	**debug ipfax t38**
Open the debugging information switch of cisco message of ipfax	**debug ipfax cisco**
Open the debugging information switch for reading and writing fax data between vpm module and voice card.	**debug vpm fax**

2.4 Typical Configuration of IP Fax

The networking mode of IP Fax is basically the same as IP Phone. Thus, the functions of IP Fax can be realized only when the telephone sets in the network of IP Phone are replaced by facsimile machines. You can basically use the functions of IP Fax only if you can configure IP Phone. The operation is easy to use.

1)   Networking Requirements

Suppose a company headquarter located in Shenzhen plans to send/receive faxes to/from its Beijing branch via IP network.

The fax number of its Beijing branch is 0101002, and the number of Shenzhen headquarter is 07551001.

The IP address used to access to the Internet port through the router in Beijing is 1.1.1.2. The IP address used to access to the Internet port through the router in Shenzhen is 1.1.1.1.

The facsimile machine in Beijing is connected with the second voice port on the router, and the facsimile machine in Shenzhen is connected with the first voice port on the router.
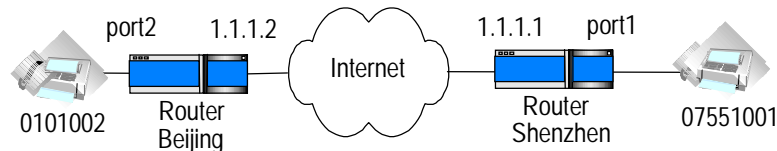
2)   Networking Diagram

Figure VC-2-2 Networking diagram for typical IP fax configuration

3)   Configuration Procedure

The parameter settings for the router in Beijing is as follows:

Quidway(config)# dial-peer voice 1 voip

Quidway(config-peer-voip1)# destination 07551001

Quidway(config-peer-voip1)# session target ipv4:1.1.1.1

Quidway(config-peer-voip1)# dial-peer voice 2 pots

Quidway(config-peer-pots2)# destination 0101002

Quidway(config-peer-pots2)# port 2

The parameter settings for the router in Shenzhen is as follows:

Quidway(config)# dial-peer voice 2 voip

Quidway(config-peer-voip2)# destination 0101002

Quidway(config-peer-voip2)# session target ipv4:2.2.2.2

Quidway(config-peer-voip2)# dial-peer voice 1 pots

Quidway(config-peer-pots1)# destination 07551001

Quidway(config-peer-pots1)# port 1